

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>20041017 WO</b>	FOR FURTHER ACTION See Form PCT/IPEA/416		
International application No. <b>PCT/FI2005/000108</b>	International filing date (day/month/year) <b>31-03-2005</b>	Priority date (day/month/year) <b>06-04-2004</b>	
International Patent Classification (IPC) or national classification and IPC <b>See Supplemental Box</b>			
Applicant <b>Outokumpu Oyj et al</b>			

  

<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>6</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p style="margin-left: 20px;">a. <input checked="" type="checkbox"/> (sent to the applicant and to the International Bureau) a total of <u>3</u> sheets, as follows:</p> <div style="margin-left: 40px;"> <input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).  <input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.         </div> <p style="margin-left: 20px;">b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>																											
<p>4. This report contains indications relating to the following items:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 10%;"><input checked="" type="checkbox"/></td> <td style="width: 20%;">Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>				<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input checked="" type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
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<input type="checkbox"/>	Box No. VIII	Certain observations on the international application																									

  

Date of submission of the demand <b>16-01-2006</b>	Date of completion of this report <b>04-07-2006</b>
Name and mailing address of the applicant Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. +46 8 667 22 88	Authorized officer  <b>Jens Waltin/ELY</b> Telephone No. +46 8 782 25 00

**Supplemental Box**

In case the space in any of the preceding boxes is not sufficient.

Continuation of: Cover sheet

**International patent classification (IPC)**

**B03D 1/16 (2006.01)**

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FI2005/000168

Box No. I Basis of the report

1. With regard to the language, this report is based on:

- ☒ the international application in the language in which it was filed
- ☐ a translation of the international application into \_\_\_\_\_,  
which is the language of a translation furnished for the purposes of:
- ☐ international search (Rules 12.3(a) and 23.1(b))
- ☐ publication of the international application (Rule 12.4(a))
- ☐ international preliminary examination (Rules 55.2(a) and/or 55.3(a))

2. With regard to the elements of the international application, this report is based on (replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):

- ☐ the international application as originally filed/furnished
- ☒ the description:  
pages 1 - 5 \_\_\_\_\_ as originally filed/furnished  
pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the claims:  
pages \_\_\_\_\_ as originally filed/furnished  
pages\* \_\_\_\_\_ as amended (together with any statement) under Article 19  
pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
pages\* 7 - 9 \_\_\_\_\_ received by this Authority on 07-06-2006
- ☒ the drawings:  
pages 1 - 2 \_\_\_\_\_ as originally filed/furnished  
pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_  
pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (specify): \_\_\_\_\_
- ☐ any table(s) related to the sequence listing (specify): \_\_\_\_\_

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (specify): \_\_\_\_\_
- ☐ any table(s) related to the sequence listing (specify): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FI2005/000168

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims	<u>1-12</u>	YES
	Claims	_____	NO
Inventive step (IS)	Claims	<u>1-12</u>	YES
	Claims	_____	NO
Industrial applicability (IA)	Claims	<u>1-12</u>	YES
	Claims	_____	NO

## 2. Citations and explanation (Rule 70.7)

This report is based upon the amended claims filed 07-06-2006. Claim 1 has been amended by specifying that the structural elements are single structural elements. Further, the subject matter of previous claim 2 has been incorporated into claim 1.

**Cited prior art:**

We refer to the following documents, cited in the International Search Report:

D1: EP 0 287 251 A2  
 D2: US 2 767 954 A  
 D3: US 3 041 050 A  
 D4: RU 2 187 330 C1

D1 relates to a flotation cell for recovery of minerals from ore, including a rotor/stator pump assembly (refer to abstract). The stator includes (refer to col. 7, lines 15-24 and fig. 5):

- four segments 26a-d,
- stator blades 30, depending from
- a top ring 32, and
- spaced standards 34, which support and attach the stator to the base plate.

D2 discloses an impeller-stator combination for flotation machines (col. 1, lines 1-20 and figures). It includes a peeler blade structure 19 made up of a plurality of individual peeler blades 21 held rigidly together in radial, mutually spaced relationship by means of four frame members 22, to which they are individually rigidly attached, as by means of welding (col. 3, lines 3-21).

.../...

**Supplemental Box**

In case the space in any of the preceding boxes is not sufficient.

Continuation of: BOX V

Thus, the stators according to D1 and D2 both comprise four structural elements (the segments 26a-d in D1 and the frame members 22 in D2). However, these elements are in both cases joined together into one rigid stator body.

D3 discloses a stator comprising stator tubes 22 supported between steel reinforced rubber stator rings 24 and 26, which hold the stator together as a rigid "squirrel cage" assembly (col. 1, lines 1-17 and col. 2, lines 61-69). This is similar to the subject matter of dependent claim 5 of the present application.

D4 discloses stator blades installed at two different levels around the rotor in a flotation cell (see figure). This is similar to the subject matter of dependent claim 7 of the present application.

**NOVELTY:**

The invention according to claim 1 differs from each of D1 and D2 in that the structural elements (1, 11, 21, 42) are single structural elements.

Furthermore, none of D3-D4 discloses a stator composed of single structural elements as claimed in present claim 1.

The stator according to claims 1-12 is thus novel.

**INVENTIVE STEP:**

The modular construction of the claimed stator enables a change of the diameter of the stator when needed, in contrast to previously known stators with fixed diameter.

It is not considered obvious to a person skilled in the art to modify the stators disclosed in D1 or D2 so as to arrive at the claimed invention. Nor would any relevant combination of the cited documents lead him thereto.

The stator according to claims 1-12 is therefore considered to present an inventive step.

**INDUSTRIAL APPLICABILITY:**

The invention is considered to be industrially applicable.

**Box No. VII Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:

Claim 9 contains a typing error on line 19.

## CLAIMS

1. A stator for a flotation cell to be used in the flotation of slurry-like material, such as ore and concentrate containing valuable minerals, by means of which  
5 stator the orientation of the slurry flow created by the flotation cell rotor can be controlled, **characterized** in that the stator (41) is composed of at least three single structural elements (1, 11, 21, 42) to be installed around the rotor (47), provided with at least one flow regulator (2; 12, 13; 22, 23, 24; 44, 45, 46) and a supporting structure (3, 14, 25, 43) whereby each single structural element (1,  
10 11, 21, 42) is connected to the flotation cell or to the fastening structure of the stator (41) arranged in the flotation cell
2. A stator for a flotation cell according claim 1, **characterized** in that each structural element (11, 21, 42) includes at least two flow regulators (12, 13; 22,  
15 23, 24; 44, 45, 46) that are interconnected by means of a supporting structure (14, 25, 43) attached at one end of the flow regulator of the structural element.
3. A stator for a flotation cell according any of the preceding claims, **characterized** in that the flow regulators (12, 13; 22, 23, 24; 44, 45, 46)  
20 provided in one and the same structural element (3, 14, 25, 43) are identical in cross-section.
4. A stator for a flotation cell according any of the preceding claims 1 – 2, **characterized** in that the flow regulators (12, 13; 22, 23, 24; 44, 45, 46)  
25 provided in one and the same structural element (3, 14, 25, 43) are different in cross-section.
5. A stator for a flotation cell according any of the preceding claims, **characterized** in that at that end of the flow regulators provided in the structural  
30 element (3, 14, 25, 43) that is opposite to the supporting structure (14, 25, 43), there is installed a connecting element (15) for interconnecting the flow

regulators (12, 13; 22, 23, 24; 44, 45, 46) arranged in the structural element (3, 14, 25, 43)

6. A stator for a flotation cell according any of the preceding claims,  
5 **characterized** in that the structural elements (3, 14, 25, 43) of the stator can be installed around the rotor (47), so that those edges of the flow regulators (2; 12, 13; 22, 23, 24; 44, 45, 46) provided in the structural elements (3, 14, 25, 43) that are located nearest to the rotation axis (48) are placed at an essentially equal distance from the rotor rotation axis.

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7. A stator for a flotation cell according any of the preceding claims, **characterized** in that the stator (41) is composed of structural elements installed on two different levels around the rotor (47).

15 8. A stator for a flotation cell according any of the preceding claims, **characterized** in that the structural element (21) of the stator is manufactured by casting in one single piece.

9. A stator for a flotation cell according any of the preceding claim 5,  
20 **characterized** in that the flow regulator (2; 12, 13; 22, 23, 24; 44, 45, 46) of the structural element of the stator and the supporting structure (3, 14, 25, 43) to be connected to the flow regulator, as well as the connecting element (15) arranged between the flow regulators, are manufactured separately by casting.

25 10. A stator for a flotation cell according claim 9, **characterized** in that the flow regulator (2; 12, 13; 22, 23, 24; 44, 45, 46) of the structural element of the stator and the supporting structure (3, 14, 25, 43) to be connected to the flow regulator are interconnected by welding.

30 11. A stator for a flotation cell according claim 9, **characterized** in that the flow regulator (2; 12, 13; 22, 23, 24; 44, 45, 46) of the structural element of the stator and the supporting structure (3, 14, 25, 43) to be connected to the flow



regulator, as well as the connecting element (15) provided in between the regulators, are interconnected by welding.

12. A stator for a flotation cell according any of the preceding claims,  
5 **characterized** in that the structural elements (3, 14, 25, 43) of the stator can be installed around the rotor (47), so that the tangential slurry jet emitted from the rotor (47) of the flotation cell can be directed towards at least one stator flow regulator (2, 12, 13; 22, 23, 24; 44, 45, 46) in order to prevent the slurry jet from flowing directly through the stator.

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